# Guneet Singh Dhillon

*Curriculum Vitae*

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*guneet-dhillon.github.io*

## Education

Oct 2021 - Current **University of Oxford**, Oxford, UK
**D.Phil. in Statistics**
- **Advisors** : Prof. Yee Whye Teh, Prof. Arnaud Doucet, Prof. George Deligiannidis, Prof. Tom Rainforth
- **Funding** : Clarendon Fund Scholarship, University of Oxford (only 1 awardee from the Department of Statistics)
- **College** : St. John's College

Aug 2014 - May 2018 **University of Texas at Austin**, Austin, TX, USA
**B.Sc. in Computer Science with Honors - Turing Scholars Honors**
**B.Sc. in Mathematics with Honors** **GPA: 3.89 / 4.00**
- **Undergrad Honors Thesis** : Training Ising Models on Images using Sparsitron (Advisor - Prof. Adam Klivans)
- **Certificate** : Applied Statistical Modeling
- **Minor** : Economics
- **Research Programs** : Freshman Research Initiative, College of Natural Sciences Directed Reading Program, Department of Mathematics

## Work Experience

Dec 2023 - Jun 2024 **Machine Learning Intern**, *Boson AI USA Inc.*, Santa Clara, CA, USA
- Developed *Lagrange Large Language Models (L3Ms)* for customization of LLMs (ICLR 2025 publication)

Jul 2018 - Sep 2021 **Applied Scientist II** (Dec 2019 - Sep 2021) and
**Applied Scientist I** (Jul 2018 - Dec 2019), *Amazon Web Services Inc.*, Pasadena, CA, USA
- Developed *Uniform Sampling over Episode Difficulty* for few-shot image classification (NeurIPS 2021 spotlight publication)
- Developed *Transductive Fine-tuning* for few-shot image classification (ICLR 2020 publication)
- Devised algorithms for *Amazon Textract* [link] (U.S. patent)
- Devised algorithms for *Amazon Rekognition Custom Labels* [link]
- Won prizes for constructing innovative solutions for other products via hackathons

May 2017 - Aug 2017 **Software Development Engineer Intern**, *Amazon Web Services Inc.*, Palo Alto, CA, USA
- Developed *Stochastic Activation Pruning* for robust image classification (ICLR 2018 publication)

May 2016 - Aug 2016 **Machine Learning Intern**, *CognitiveScale Inc.*, Austin, TX, USA
- Built a search and recommendation system using probabilistic non-negative matrix factorization and Gibbs sampling techniques

May 2015 - Aug 2015 **Software Technology Engineering Intern**, *Dell Inc.*, Austin, TX, USA
- Implemented a Windows 10 Universal App. to connect and share features between devices

## Publications

Oct 2024 **L3Ms — Lagrange Large Language Models** [pdf]
**Guneet S. Dhillon**, Xingjian Shi, Yee Whye Teh, Alex Smola
- In Proceedings of **International Conference on Learning Representations (ICLR) 2025**

May 2024 **On the Expected Size of Conformal Prediction Sets** [pdf] [code]
**Guneet S. Dhillon**, George Deligiannidis, Tom Rainforth
- In Proceedings of **International Conference on Artificial Intelligence and Statistics (AISTATS) 2024**

Dec 2021 **Uniform Sampling over Episode Difficulty** [pdf] [code]
Sébastien M. R. Arnold*, **Guneet S. Dhillon***, Avinash Ravichandran, Stefano Soatto
* Equal contributions
- In Advances in **Neural Information Processing Systems (NeurIPS) 2021 (Spotlight)**

May 2020 **A Baseline for Few-Shot Image Classification** [pdf] [code]
**Guneet S. Dhillon**, Pratik Chaudhari, Avinash Ravichandran, Stefano Soatto
- In Proceedings of **International Conference on Learning Representations (ICLR) 2020**
- Short version in Proceedings of Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS) 2019 (Spotlight)

May 2018 **Stochastic Activation Pruning for Robust Adversarial Defense** [pdf] [code]
**Guneet S. Dhillon**, Kamyar Azizzadenesheli, Zachary C. Lipton, Jeremy Bernstein, Jean Kossaifi, Aran Khanna, Anima Anandkumar
- In Proceedings of **International Conference on Learning Representations (ICLR) 2018**
- Short version in Proceedings of Machine Deception Workshop, Conference on Neural Information Processing Systems (NeurIPS) 2017

## Preprints and Other Articles

Sep 2020 **Erratum Concerning the Obfuscated Gradients Attack on Stochastic Activation Pruning** [pdf]
**Guneet S. Dhillon**, Nicholas Carlini

## Theses

May 2018 **Training Ising Models on Images using Sparsitron** [pdf]
Undergraduate Honors Thesis
- Advisor : Prof. Adam Klivans
- Co-Advisor : Dr. Philipp Krähenbühl

## Patents

Nov 2020 **Structured Document Analyzer** [pdf], U.S. Patent 10,839,245
**Guneet S. Dhillon**, Vijay Mahadevan, Yuting Zhang, Meng Wang, Gangadhar Payyavula, Viet C. Nguyen, Rahul Bhotika, Stefano Soatto

## Talks and Presentations

**Uniform Sampling over Episode Difficulty**
Feb 2022 Seminar on Continual-Learning/Meta-Learning/Transfer-Learning, Google DeepMind

**A Baseline for Few-Shot Image Classification**
Jul 2021 Workshop on Computer Vision with Limited Labels, Amazon Computer Vision Conference
Dec 2019 Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS)
Jul 2019 Workshop on Computer Vision Services/Systems in Amazon, Amazon Machine Learning Conference
Jul 2019 Workshop on Data-Efficient Learning Techniques for Amazon Scale, Amazon Machine Learning Conference

## Academic Services

**Organizing Committee Member**
2024 ELLIS Robust Large Language Models Workshop
2024 ELLIS Robust Machine Learning Workshop
2023 ELLIS Robust Machine Learning Workshop

**Program Committee Member**
2022 Conference on Lifelong Learning Agents (CoLLAs)

**Reviewer**
Conference on Neural Information Processing Systems (NeurIPS)
International Conference on Machine Learning (ICML)
International Conference on Learning Representations (ICLR)
International Conference on Artificial Intelligence and Statistics (AISTATS)
AAAI Conference on Artificial Intelligence (AAAI)
Conference on Lifelong Learning Agents (CoLLAs)
Amazon Machine Learning Conference

## Teaching

**Teaching Assistant**

Oct 2022 - Jan 2023 Foundations of Statistical Inference, Department of Statistics, Oxford *(George Deligiannidis)*
Jan 2016 - May 2016 Matrices and Matrix Calculations, Department of Mathematics, UT Austin *(John Gilbert)*

## Honors and Awards

Oct 2021 - Current Clarendon Fund Scholarship, Oxford *(only 1 awardee from the Department of Statistics)*
Aug 2017 - May 2018 Out-of-State Tuition Waiver, College of Natural Sciences, UT Austin *(only 5-7 awardees)*
Aug 2017 - May 2018 Thomas and Elizabeth Merner Scholarship in Natural Sciences, College of Natural Sciences, UT Austin
Aug 2017 - May 2018 Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Department of Computer Science, UT Austin
Apr 2018 College Scholar, College of Natural Sciences, UT Austin
Aug 2016 - May 2017 Motorola Endowed Scholarship, Department of Computer Science, UT Austin
Apr 2017 College Scholar, College of Natural Sciences, UT Austin
Aug 2015 - May 2016 Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Department of Computer Science, UT Austin
May 2015 - Aug 2015 TIDES FRI Summer Research Fellowship, College of Natural Sciences, UT Austin
Aug 2014 - May 2015 Freshman Scholarship, College of Natural Sciences, UT Austin *(only 5% of freshmen awardees)*
Aug 2014 - May 2015 Schein Memorial Scholarship, Department of Computer Science, UT Austin

## Other Undergraduate Research Projects

Jan 2016 - Dec 2017 **Clustering and Prediction in Time-Series Data**, with Dr. Sinead Williamson
Clustering time-series data and predicting future values by modeling the data using an infinite mixture of probabilistic auto-regressive models, learned using Gibbs sampling techniques

Nov 2017 - Dec 2017 **Generative Adversarial Networks (GANs) for Adversarial Training** [pdf], course project
Robust image classification using a generator-discriminator formulation to train deep networks

Nov 2016 - Dec 2016 **Conflict Graphs for Parallel Stochastic Gradient Descent** [pdf], course project
Training SVMs by exploring conflict graphs to parallelize stochastic gradient descent training

Jan 2015 - May 2015 **Genetic Algorithms for Efficient 3D Printing**, Freshman Research Initiative project
Minimizing the overhang region in 3D printing using genetic algorithms to obtain slicing planes

Apr 2015 - May 2015 **Efficient Thread Scheduling**, course project
Reducing the wait-time for threads by scheduling them based on past CPU and I/O times

## Coursework

Audited Courses Oxford, 2021-22 Algorithmic Foundations of Learning *(Patrick Rebeschini)*, Computational Learning Theory *(Varun Kanade)*, Theories of Deep Learning *(Jared Tanner)*

Audited Courses Caltech, 2018-20 Linear Algebra and Convexity *(Joel Tropp)*, Foundations of Machine Learning and Statistical Inference *(Anima Anandkumar)*, Foundations of Machine Learning *(Anima Anandkumar)*

Graduate Courses UT Austin, 2016-18 Convex Optimization *(Constantine Caramanis)*, Linear Models *(Peter Müller)*, Numerical Analysis: Linear Algebra *(George Biros)*

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| Undergraduate Courses<br>UT Austin, 2014-18 | Machine Learning / Vision: Honors *(Kristen Grauman)*, Artificial Intelligence: Honors *(Peter Stone)*, Honors Statistics: Honors *(James Scott)*, Geometric Foundations of Data Science *(Chandrajit Bajaj)*, Introduction to Data Mining *(Adam Klivans)*, Introduction to Stochastic Processes *(Stephen Walker)*, Introduction to Quantum Information Science *(Scott Aaronson)*, Randomized Algorithms *(David Zuckerman)*, Algorithms and Complexity: Honors *(Eric Price)*, Differential Equations with Linear Algebra: Honors *(Dan Knopf)*, Real Analysis I *(Hector Lomeli)*, Computational Intelligence in Game Research / Design I & II *(Cem Tutum)*, Introduction to Probability & Statistics *(Sinead Williamson)*, Matrices and Matrix Calculations *(John Gilbert)*, Financial Economics *(Svetlana Boyarchenko)*, Introductory Game Theory *(Dale Stahl)*, Microeconomic Theory *(Gerald Oettinger)*, Principles of Computer Systems: Honors *(Ahmed Gheith)*, Computer Organization & Architecture: Honors *(Ahmed Gheith)*, Discrete Math for Computer Science: Honors *(Isil Dillig)*, Data Structures: Honors *(Calvin Lin)*, Competitive Programming *(Etienne Vouga)* |

## Miscellaneous Activities

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| Oct 2021 - Current | Member of the Clarendon Scholars' Association, Oxford |
| Aug 2014 - May 2018 | Member of the Turing Scholars Student Association, UT Austin |
| Aug 2014 - May 2018 | Member of the Sikh Student Association, UT Austin |
| Aug 2016 - May 2017 | School Relations Director for the Undergraduate Machine Learning Labs, UT Austin |
| Oct 2016 | Secured seventh position in the Electronic Trading Challenge, UT Austin |
| Jan 2015 - May 2016 | Member of the Texas Table Tennis Team, UT Austin with an NCTTA Rank of 689 |
| Feb 2016 | Secured fourth position and an honorable mention in the dataHACK, UT Austin |
| Aug 2014 - Dec 2015 | Member of the Longhorn Cricket Club Team, UT Austin |